SLOVENSKI STANDARD
SIST-TS CEN/TS 16238:2011

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Poštne storitve - Odprti vmesnik med strojnim procesorjem in bralnim kodirnim sistemom - Vmesnik MC/RC

Postal services - Open Interface between Machine Control and Reading Coding System - MC/RC-Interface

Postalische Dienstleistungen - Offene Schnittstelle zwischen Maschinensteuerung und Lese- und Codier-System - MC/RC-Schnittstelle

Services postaux - Norme ouverte pour l'interface entre le processeur d'image, la commande numérique et le contrôleur d'image

Ta slovenski standard je istoveten z: **CEN/TS 16238:2011**

ICS:

03.240	Poštne storitve	Postal services
35.200	Vmesniška in povezovalna oprema	Interface and interconnection equipment

SIST-TS CEN/TS 16238:2011 **en,de**

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TECHNICAL SPECIFICATION

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CEN/TS 16238

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English Version

Postal services - Open Interface between Machine Control and Reading Coding System - MC/RC-Interface

Services postaux - Interface ouverte entre le système de Contrôle de la Machine et le système de Reconnaissance et de Codage - Interface MC/RC

Postalische Dienstleistungen - Offene Schnittstelle zwischen Maschinensteuerung und Lese- und Codier-System - MC/RC-Schnittstelle

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CEN/TS 16238:2011 (E)

Foreword

This document (CEN/TS 16238:2011) has been prepared by Technical Committee CEN/TC 331 "Postal Services", the secretariat of which is held by NEN.

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Introduction

There is a growing demand for postal operators to combine parts of their sorting automation equipment from different suppliers in order to optimise performance. In the past, this has led to project-specific interfaces being negotiated between one postal operator and one or multiple suppliers. These project-specific interfaces were developed by the suppliers and maintained for an agreed period. This approach has several disadvantages:

— The interface is derived from an interface that was not intended to be open.

— The interface is developed for a single project and works only in the context of that project (extra costs).

— Each participating supplier has to implement the interface (multiple effort).

— Experience shows that integration of components with project-specific interfaces is complex and expensive.

— Project-specific interfaces are not integrated into the product line and once the initially agreed maintenance period is over it may be difficult and expensive to maintain and/or may hinder the adoption of equipment upgrades.

This has led to "open interfaces" defined by one supplier. These still have the disadvantage of being in product use only by one supplier. Within a group of postal operators and suppliers it was decided to develop a set of "open standard interfaces" which will be developed by the suppliers and referred to by the postal operators. The benefits of these interfaces are expected to be that they:

— are fixed in an international standard (with change control);

— are agreed and implemented by major suppliers;

— are agreed by customers and therefore used in calls for tenders;

— will result in net savings with the high initial development effort and consequent higher basic equipment prices being more than offset by reduced project development, integration and maintenance costs;

— will minimize the need for project integration effort by reducing implementation timescales;

— will increase competition between suppliers by stimulating product improvements;

This Technical Specification covers the interface between an image controller (IC), the scanner subsystem including the scanner related image processing (IP) devices and the machine control (MC) subsystem of postal automation equipment. One related standard is CEN/TS 15448, *Postal Services – Open Standard Interface between image controller and enrichment devices (OCRs, video coding systems, voting systems)*.

Other work items (subject to agreement of CEN/TC 331 and the UPU Standards Board) will be defined to cover other areas as and when the need is identified and the resources for development become available. A separate project group for each interface will undertake the work.

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1 Scope

This Technical Specification describes the "Open Standard Interface between Image Processor, Machine Control and Image Controller" (IP/MC/IC Interface) in the context of postal automation equipment.

The following architectural overview is the basis for this interface standardization:
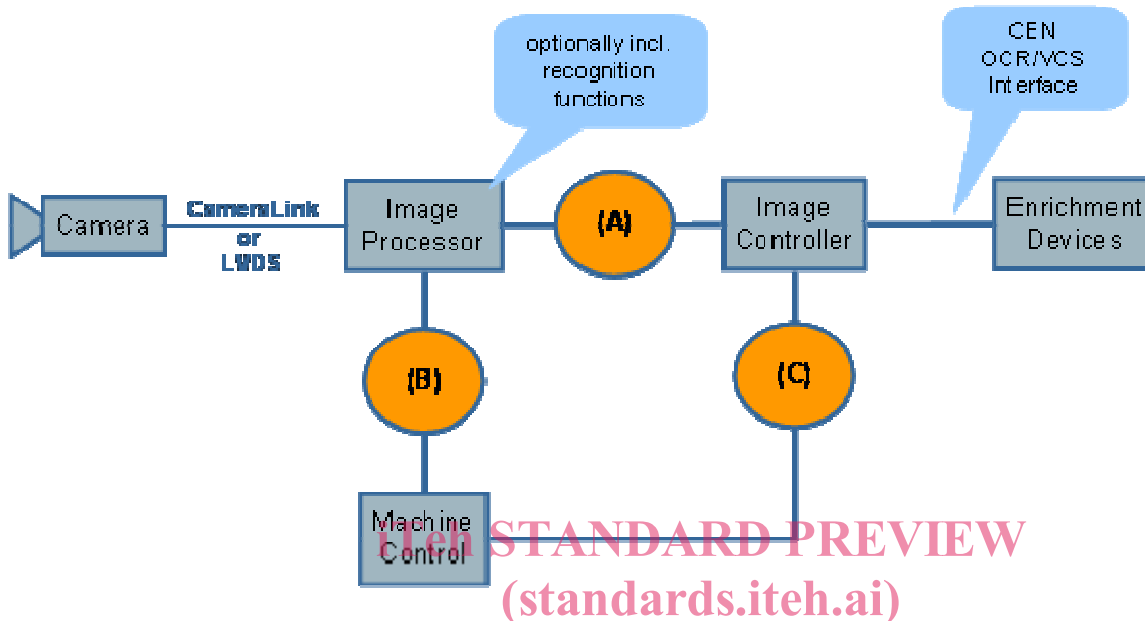
Figure 1 — System overview

It was agreed to unify the interfaces between

a)   Image Processor and Image Controller,

b)   Image Processor and Machine Control and

c)   Machine Control and Image Controller

and to produce one common specification for this so-called **IP/MC/IC Interface**.

The communication partners of this interface will be called Machine or Machine Control (MC) on the one side and Reading/Coding (RC) System on the other side.

There may be several instances of this interface, depending on the implementation of the MC and the connected RC.

NOTE   interfaces for synchronizing the lifted images with their mailpiece_IDs provided by the machine are not shown in the figure above and are not subject of standardization within the first release of this interface.

From the customer point of view, the following two scenarios are relevant. The systems MACHINE and RC SYSTEM are to be considered as "black boxes" thus not detailing internal system structure and interfaces.

1)   The Machine already includes Camera and Image Processor and will be connected to a 3rd-party RC System including Image Controller and Enrichment Devices.
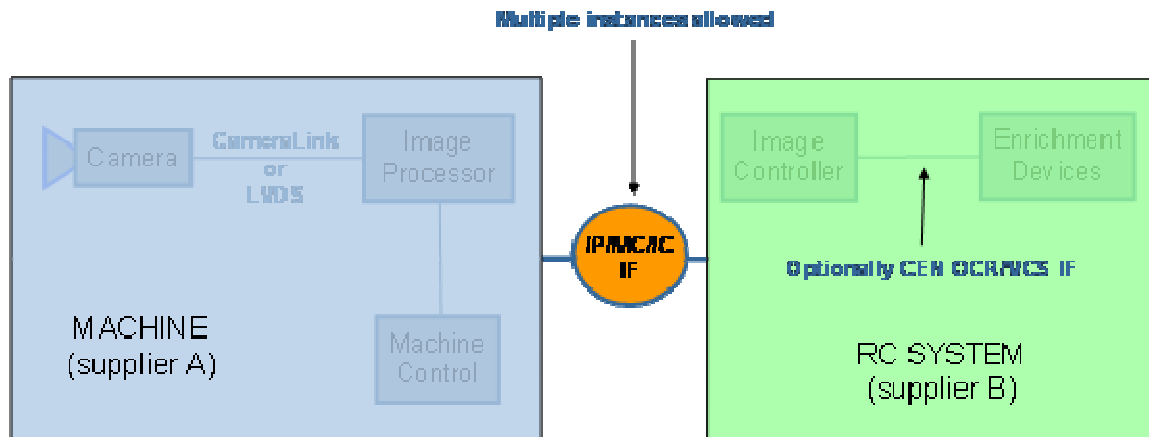
Figure 2 — System interfacing scenario 1

2) The Machine will be connected to a 3rd-party RC System including Camera, Image Processor, Image Controller and Enrichment Devices. The Camera and (possibly) the Image Processor will have to be mechanically integrated into the machine.

NOTE   The camera can be provided by any 3rd-party. This should not impede on the IP/MC/IC interfaces !
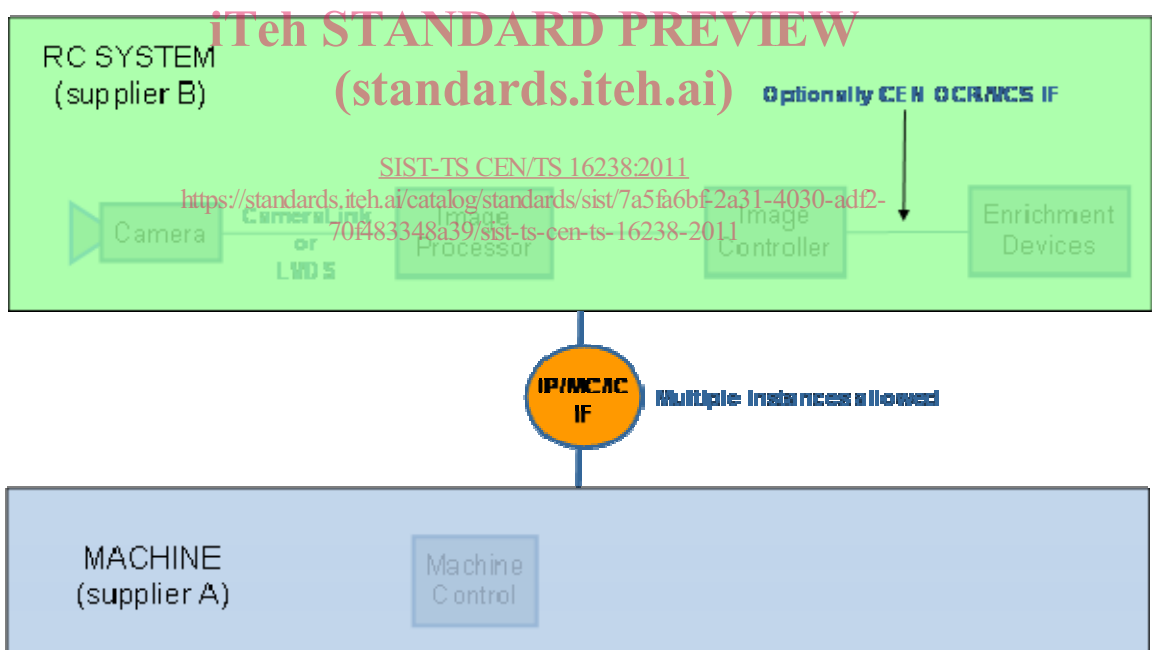

Figure 3 — System interfacing scenario 2

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This standard is arranged under four main clauses as described in Figure 4.

— UCM (Use Case Model) describes the use cases for the IP/MC/IC Interface using sequence diagrams with messages.

— IDD (Interface Design Description) defines the data model for the IP/MC/IC interface.

— SDD (System Design Description) defines the mandatory specification of the IP/MC/IC interface in terms of architecture, services and behavioural models. In the Common Part of this clause no middleware or transport layer is specified. The common part of this clause is intended to be middleware-independent.

— SDD-TCP/IP, SDD-CORBA, SDD-SOAP in these specialized clauses. The specifications for three compatible transport solutions TCP/IP, CORBA and SOAP are provided. Further middleware solutions can be added when available, provided that they are fully compatible with the Common Part.
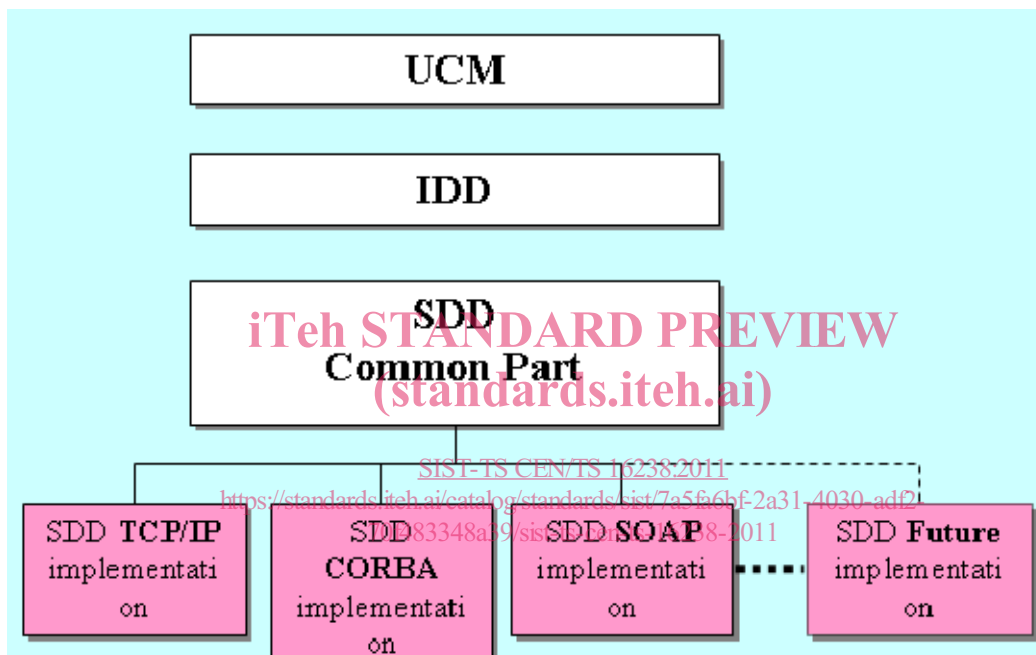
Figure 4 — IP/MC/IC Interface Document Structure

2 Normative References

The following referenced documents are indispensable for the application of this document. For dated references, or references to a version number, only the edition cited applies. For undated references and where there is no reference to a version number, the latest edition of the referenced document (including any amendments) applies.

— CEN/TS 15448, *Postal Services – Open standard interface between image controller and enrichment devices (OCRs, video coding systems, voting systems)*

3 Terms and definitions

3.1
actor
coherent set of roles which users of uses cases play when interacting with these use cases. An actor has one role for each use case with which it communicates. See [1]

3.2
attributes
all non-image information related to a mailpiece

3.3
coding Desk
computer or terminal equipped with software to display images of mailpieces, and designed for a human operator (video coder) to enter information about the mailpiece

3.4
component
software Unit with a defined interface; might contain other components

3.5
data element
simple data type

3.6
data object
assembly of elements [1..*] and/or other data objects; recursive type

3.7
enrichment
process of generating new information about a mailpiece

NOTE   Any information about the mailpiece may be used in this process, such as the image, image information or result data. The use of an image however, is not compulsory

3.8
enrichment device
system designed to enrich information about mailpieces

3.9
image
data acquired by the Image Processor (including scanner device) and stored as part of the mailpiece

3.10
image controller (IC)
the device that handles all the image data and results exchange between the transport and the enrichment devices – it is part of the RC system

3.11
image processor (IP)
the device that manages and processes images from the camera device – it may be in the Transport or in the RC system, depending on implementations

3.12
infrastructure data
the basic information, such as identification references which an Image Controller and Enrichment Device require in order to communicate effectively

EXAMPLE   Letter ID, Submission ID.

3.13
machine control
the device - including software - that manages all transport functions inside postal automation equipment

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3.14
mailpiece data
the information which describes attributes of the physical mailpiece which is used to aid and is a product of enrichment

EXAMPLE   mailpiece width & height, indicia information, address location, city name, sort code etc.

3.15
offline
operational mode of a sorting machine, in which some processing of mail is done after the mail has been conveyed in the machine; there is a need for identification of individual mailpieces, to re-identify the mailpiece for which an additional sorting pass is required

NOTE   Identification of mailpieces can be done by printing an ID-tag on individual mailpieces or by using print less identification means.

3.16
online
operational mode of a sorting machine, implying all the processing of mail is done while the mail is conveyed in the machine

NOTE   Processing of mail may include sorting to output bins, printing of information on the mailpiece and other.

3.17
permanent error
fatal error as indicated by the middleware or application layer.

NOTE   A non-fatal error may be considered to be a permanent error after repeated remedial handling

3.18
reading Coding System (RC System)
the system that provides image handling (the IC function) and retrieval of mailpiece data (ED function) from the images, depending on implementations

3.19
result
outcome of enrichment

3.20
street
street keying (street name and/or house number in street)

3.21
system
consists of components and the relationships between them (interfaces, communication)

4   Symbols and abbreviations

ED: Enrichment Device (OCR, Video Coding, Voter system)

IC: Image Controller

ID: Identifier

IP: Image Processor

IDD: Interface Design Description

MC:	Machine Control
mpID:	Mailpiece Identification information
OCR:	Optical Character Recognition
PC:	Post Code
RC:	Reading (OCR) and Coding
ROI:	Region Of Interest
SDD:	System Design Description
UCM:	Use Case Model
UDDI:	Universal Description, Discovery and Integration
VCS:	Video Coding System
W3C:	World Wide Web Consortium
XML:	eXtendable Markup Language

5 Use Case Model (UCM)

This clause describes the use cases for the "Open Standard Interface between Image Processor, Machine Control and Image Controller" (IP/MC/IC Interface) using sequence diagrams with messages.

5.1 Conventions

Agreed syntax for use case names:

— Capital letter at the beginning of each word

— No underlines to connect the single words

EXAMPLE   Submit Mailpiece

Agreed syntax for message names:

— No capital letter at the beginning of each word

— Underlines to connect the single words

EXAMPLE   establish_connection

5.2 Use Case Overview

As already indicated in the system interfacing scenarios in Clause 1, there may be several instances of this interface between a Machine and the RC System. Each interface instance handles a point-to-point connection.

The use cases as listed in the table below and detailed in 5.3 describe the behaviour of an individual instance of this interface and do not need to consider any other instances.

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Table 1

ID	Name	Description
UC01	Publish and Select Server	The RC System publishes its presence to a Server Selection service. The Machine uses the service to identify the RC System.
UC02	Connect	The Machine connects to the RC System. As part of connection protocol, the RC System indicates its capabilities. RC System capabilities (related to scenarios 1+2, see Clause 1) are, for example: • Coding requests (with images) • Result Storage • Solicited result transmission to the Machine • Unsolicited result transmission to the Machine • Result requests based on ID-tag RC System capabilities (related to scenario 2, see Clause 1) are, for example: • Coding requests (without images) • Solicited result transmission to the Machine • Barcode recognition requests • Result requests based on ID-tag The capabilities of the RC System are checked against the expectations of the Machine. For example, in case the capabilities are not the expected ones, the Machine may disconnect and raise an alarm. The Machine indicates whether unsolicited results are expected or not for this connection.
UC03	Disconnect	The Machine or the RC System disconnects.
UC04	Submit Mailpiece	The Machine submits coding requests, with or without an image. The coding request identifies which attributes are expected and capabilities of the RC System to be used. There may be multiple submit_mailpiece messages for a single mailpiece (e.g. one request for id-tag reading, a later request for address reading).
UC05	Request Mailpiece Attributes	Request mail piece attributes from the tag database within the RC System.
UC06	Transmit Mailpiece Attributes	The RC System returns mailpiece attributes to the Machine, either in response to a Submit Mailpiece or a Request Mailpiece Attributes. The Transmit Mailpiece Attributes may also be returned on a different instance of the interface than the Submit Mailpiece was issued (e.g. on-line VCS results depending on machine architecture). There may be multiple responses of Transmit Mailpiece Attributes for a single "Submit Mailpiece" message, e.g. partial OCR results followed with final VCS result.
UC07	Update Mailpiece Attributes	The Machine reports new or changed attributes in order to update the mailpiece attribute database on the RC System (e.g. indicating the sort

ID	Name	Description
		bin).
		This use case is also used to indicate the events "Item Out Of Delay Line" and "Cancel Submit Mailpiece" to the RC System.
		Item Out Of Delay Line: The Machine indicates it has no further use for online OCR/VCS results for the specified mailpiece (e.g., mailpiece has reached the end of delay line). The RC System should avoid further online OCR/VCS processing.
		Cancel Submit Mailpiece: The Machine indicates it has no further use for the requested coding results for the specified mailpiece. The RC System shall avoid further OCR/VCS processing.
UC08	Request Image	The Machine requests an image from the RC System (incl. the IP). The image is used for batch ROI coordinates or for sample images for display.
UC09	Transmit Image	The RC System (incl. the IP) sends an image to the Machine, in response to Request Image.
UC10	Get RC System Status	The Machine requests status of the RC System.
UC11	Put RC System Status	The RC System indicates the status of its different capabilities to the Machine. In case of status change, this can also be unsolicited.
UC12	Get Machine Status	The RC System may request the status of the Machine (for example periodically).
UC13	Put Machine Status	The Machine indicates its status to the RC System, in response to a Get Machine Status (includes for example machine running, operation mode…). In case of status change, this can also be unsolicited.

5.3   Detailed Use Case Descriptions

General remarks for all use cases:

— The data structures shall be as close as possible to the ones of CEN/TS 15448.

— "mpID" means "unique mailpiece identifier" which may be an "online" mailpiece ID or an "offline" ID-tag.

— Messages drawn with dotted lines do not belong to the described use case but are included for better understanding.